WHAT IS CLAIMED IS:

1. A method of routing one or more information query from one or more arbitrary sensor network entry points in a network of sensor nodes to one or more destination nodes in the vicinity of physical phenomena of interest in the network, comprising:

selecting a destination node by computing the utility of a plurality of network sensor nodes and selecting the node with the highest utility to be the destination node;

establishing a leader node;

using a multiple step lookup procedure to determine an optimum path between the leader node and the destination node; and

routing the information query to a destination node based on the determined optimum path.

2. A method of routing an information query of claim 1, wherein the multiple step lookup procedure comprises:

determining a minimum number of hops required to reach the destination node from the leader node;

determining all possible paths of the minimum number of hops or less from the current leader node to the destination node;

determining the utilities of all possible minimum number of hops paths;

selecting a minimum number of hops path that traverses the nodes the sum of whose utilities is the greatest; and

selecting a first node in the selected path and passing leadership from the leader node to the first node.

3. A method of routing an information query of claim 1, wherein finding the min-hop path between a source and a destination comprises:

adding a very large positive value to the cost of all links of each path.

4. A system to route information via a network of sensor nodes from a leader node to a destination node, comprising:

a destination node selection mechanism, that determines the utility of a plurality of nodes and selects a node with the highest utility to be the destination node;

a processing mechanism that determines a minimum number of hops required to reach the destination node from a current leader node;

a processing mechanism that determines a number of possible paths within a specified number of hops or less from the current leader node to the destination node;

a path selection mechanism that selects the m-hop path that traverses the nodes the sum of whose utilities is the greatest; and

a selection mechanism that selects the first node in the selected path and passes leadership from the leader node to the first node.

5. The system of claim 4, wherein the selection mechanism comprises:

a mechanism adds a very large positive value to the cost of all links of each path; and

a mechanism that runs a shortest path algorithm to determine the best among the minimum hop paths from the leader node to the destination node.

6. The system of claim 4, further comprising;

a leadership transfer mechanism that changes leadership from one node to another node.

7. A point-to-point query routing method via a network of sensor nodes including a source sensor node and a destination sensor node, comprising:

establishing a neighborhood around the source sensor node;

determining costs associated with communication that has already occurred along paths to neighborhood sensor nodes and costs associated with going forward along paths to sensor nodes in the neighborhood of the source node;

determining information gain based on neighborhood network sensor nodes already visited for a number of paths and to be visited for a number of paths; and

conducting an RTA* type forward search to relay from the entry point to the destination point based on the determined cost and information gain.

8. A method of routing information about the location of an event via a network of sensor nodes including a leader node and a destination node, comprising:

selecting a destination location by computing the utility of a plurality of nodes and selecting a node with the highest utility to be the destination node;

determining a minimum number of hops required to reach the destination location from a current leader node;

determining all possible paths within a specified number of hops or less from the leader node to the destination node;

selecting a path that traverses the nodes the sum of whose utilities is the greatest; and

selecting a first node in the selected path and passing leadership from the leader node to the first node.

9. A method of routing a query about the location of an event of interest via a network of sensor nodes, comprising:

determining a source sensor node;

establishing a neighborhood around the source sensor node;

determining costs associated with communication that has already occurred along paths to neighborhood sensor nodes and costs associated with going forward along paths to neighborhood sensor nodes;

determining information gain based on neighborhood network sensor nodes already visited for a number of paths and to be visited for a number of paths;

forming a belief state about the event location based on the determined communication costs and determined information gain; and

routing the query based on the belief state.

10. The system of claim 4, wherein the sensor nodes comprise different types of sensors.

11. The system of claim 4, wherein the sensor nodes comprise acoustic sensors.

12. The system of claim 4, wherein the sensor nodes comprise seismic sensors.

13. A method of information-directed query routing along a path from a source node to a destination node in a network of sensor nodes, comprising:

determining a path that is relatively efficient in terms of communication cost; and

maximally aggregating gain of information about the event along the path; and

routing the query based on the determined cost and aggregated information gain.

14. A method of point-to-point routing of query information regarding a phenomenon of interest in a sensor network having a plurality of sensor nodes along a path from an arbitrary entry point node to an arbitrary exit point node , comprising:

establishing a leader node;

maximally aggregating information about the phenomenon of interest along the path by estimating the information expected to be gained from the entry node to the destination node;

selecting a successor leader node based on the estimated information expected to be gained; and

routing the query based on the maximally aggregated information.

15. The method of claim 14, wherein estimating the information expected comprises establishing and moving a frontier and iteratively expanding the nodes on the frontier until the exit point node is reached.

16. The method of claim 14, wherein the arbitrary exit point is the location of an event of interest and further comprising:

obtaining network node sensor measurements to refine target estimates.

17. The method of claim 13, wherein maximally aggregating gain of information about the target along the path finding a path that includes determining detours around sensor network holes and at least one path ending.

18. The method of claim 13, wherein maximally aggregating gain of information about the target along the path finding a path that includes determining detours around sensor network holes and at least one path ending.